The macdonald Journal

APRIL 1974

THE MACDONALD LASSIE

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In This Issue

urnal Jottings:

I was seeking that always sive opening sentence to these tings early this morning, an ricultural undergraduate stopped say hello. She told me that her ther, a W.I. member of the lbourne Ridge branch, was a thful Journal reader. What a nice y to start the morning — it ffirmed my knowledge of the se affinity between Macdonald d the community. An article in s issue "Excess Manure Can Be xic" is further proof; the author, . Gordon Barnett, studied for Master's degree here at cdonald. The energy crisis has used a shortage of commercial tilizer and just as we were cussing an article on this subject ng came Mr. Barnett's article. s always gratifying to get a er from a former student but what a pleasant bonus to receive an article as well. Particularly when it is so timely.

But before you settle down to read this and the other articles and features in this issue, may I draw your attention to our guest editorial by Dr. A.C. Blackwood, Dean of the Faculty of Agriculture and Vice Principal of Macdonald College. His editorial speaks for itself; I can only add that I sincerely hope his next editorial will be the one we have all been waiting for. And that is not an editorial "we" — that "we" stands for a College and the community it serves.

Hazel M. Clarke

Guest Editorial

In the last issue of the Journal Gordon Bachman in his editorial pointed out very clearly that during the last five years the Faculty of Agriculture at Macdonald College has changed and improved its curriculum. Our undergraduate student numbers in the degree course have increased from 151 in 69/70 to 366 in the present year, and this reflects an active and vital staff concerned with teaching, research, and extension. Research funds have remained high and exciting new developments are taking place. Extension activities are impinging on our community in many operations and most of our clients involved in food production or in food processing are involved in one or more of these enterprises.

Almost two years have passed since I became Dean of the Faculty of Agriculture, and my hope was that our major problem would have been solved long before now. However, the future plans of the Faculty of Agriculture and of Macdonald College are still under heavy discussion with the Senate of McGill recently supporting, by a close vote, the proposal to move the Faculty to the Montreal Campus. The Board of Governors has not yet made a decision but will probably before you read this message. The proposal is that most of the teaching and some research activities will be housed in new facilities on the Montreal Campus, but the Farm and Arboretum at Macdonald will be retained and suitable facilities provided for the use of those using the field station. No plans have been made by McGill for the future of the academic buildings at Macdonald, although there is some thought that John Abbott College, now in rented space with 2,600 students at Macdonald and more at Kirkland, may take over these facilities. They have planned for a move to a new building at Pointe Claire but have also considered in a detailed report their requirements if they remain here.

Clearly, the ultimate decisions will be made by the Minister of Education and presently he is awaiting advice from McGill, from Mr. David Stewart, and has already received reports from the Conseil des Recteurs who have approved the move of the Faculty, in principle.

In the light of all these opinions why are the students, the Faculty, our Alumni, many of our community, and Mr. David Stewart, representing the heirs of the Founder, opposed to the move? Each has his own reasons depending on his view of priorities. One of the increasingly evident problems is the need for increased training and research into food production and processing. The move will change our abilities in these directions. The future needs of the country will be for more developments to cope with the local and world prospects for enough food. Like the energy crisis our ability to survive the food crisis that is coming will be determined in good part by our abilities to produce in our own backyard. We will need more developments in teaching, in research, and in extension if we are to play our role in assisting with these demands.

We can see a sound future for our Faculty, especially at Macdonald. I hope we get a decision soon to this vexing problem: indecision over the last years is hard to live with. We are working hard for what we think is the right solution. If you have any suggestions let me know — or Principal Bell — or the Minister of Education. We all need your advice.

A.C. Blackwood,
Dean, Faculty of Agriculture,
Vice-Principal Macdonald College

CORN WEED CONTROL 1974

by Professor Walker Riley,
Department of Agronomy.

Corn is now one of Quebec's major field crops, and all signs point to continued growth. We could use several times the present production. Supply will not likely catch up to demand.

Herbicides have played a spectacular part in the rapid increase of corn acreage. However, we are now willing to concede that herbicides are not, and perhaps never will be, a 100 per cent magical answer to the corn weed problem. Our dream goal of a weed-free environment keeps one jump ahead of us. Nature is just too smart for that. Herbicides are nothing more or less than a valuable new tool in our forever fight against weeds. Particularly, they catch that important early competition damage, and they release the grower from long, long hours on the cultivator. But there is still a very important place for the time-proven practices of crop rotation, tillage and the competition of the crop itself, to control those unwanted plants we call weeds. Indeed, there is still an occasional place in the corn field for a well-directed hoe, powered by a pair of youthful bicep muscles.

Your choice of a herbicide and its time of application will depend on your weed problem.

Atrazine still holds its place as the number one herbicide in the corn field. As a basic recommendation, use two pounds active atrazine (that is 2.5 lbs 80 W or 2.25 lbs 90 W) in 20 or 30 gallons of water and apply as soon after planting as is convenient. Then pray for a light rain to move it into the root zone of the germinating weed seedlings. If it does not rain, cultivating lightly will help. If it suits your system best, you can put atrazine on ahead of planting, and work it lightly into the soil. Or if you get caught by spring work, you can delay it until the corn is up, providing you do not let the weeds get more than two inches high.

Where the weeds are up, adding 1½ gallons of a special mineral oil does give atrazine an extra kick, but there is a risk of damaging the corn if the weather turns cold and the growth is slow. Other additives are no more effective than oil; some are quite rough on the corn.

Perhaps it should be noted in passing that there are now several brands of atrazine on the market. The original now sells under the brand names of Aatrex. The mysterious W on the label (e.g. 80 W) simply means that it is formulated as a wettable powder and that it has such and such a per cent active ingredient. The new liquid formulation is more expensive, but it does save mixing time and agitation problems.
If you have a quackgrass problem (most farms in eastern Canada have), do not send a boy on a man's errand. Double your rate of atrazine and put it on at two different times: fall-spring, or spring-spring before and after planting. And that solution introduces a new problem: residues. If you have used more than 1½ pounds atrazine, there is a fair risk of enough carry-over to damage next year's crop. So you are stuck with corn for another year in that field. However, among the cereals, wheat and barley are more tolerant to atrazine residues than oats.

That takes care of the simple weed problems in corn, and for the first five years a man is growing corn these two basic atrazine treatments should be all he needs. But sooner or later in an intensive corn system, a grower will find he has a build-up of annual grasses; crabgrass, yellow foxtail, witchgrass, barnyard grass. For that situation atrazine needs a helper in the tank, like alachlor (Lasso) or cyanazine (Bladex). And that, of course, increases the price to $8 or $10 an acre. A mixture of atrazine and simazine (sold under the trade name of Ekko) is effective too, but the residue problem is increased.

Any one of the above treatments very effectively takes care of the annual grass problem, plus the annual broad-leaf weeds. But then a new and more difficult problem may creep in — the hard-to-kill perennial weeds, like nutsedge, horsetail, sow-thistle, Canada thistle, and milkweed. Each calls for special treatment.

Nutsedge is controlled quite well by butylate (Sutan) which must be applied to dry soil and immediately disked in before the crop is planted. This year, a new formulation of Sutan will be available with a protectant added to guard against possible damage to the corn. A related herbicide, EPTC (Eptam) with the protectant added (Eradicane) may also gain Canadian registration in 1974.

Horsetail in corn is hit hard by linuron (Lorox) applied when the corn is a foot or 18" high, but you must use drop pipes on the sprayer to avoid spraying the corn foliage.

Bindweed and thistles can be controlled with 2, 4-D or dicamba (Banvel) or a commercial mixture (Kilmor) with the two. They are

(Continued on Page 20)

Genetic Resistance, Genetic "Tricks" and Insect Control

by P. G. Fontana,
Postgraduate Student,
Department of Entomology.

It may seem a sad paradox but insects are already succumbing to very ingenious and subtle genetic "tricks" that they themselves have enabled scientists to conceive. Sex, chromosomes, genes, mutations, mysterious or obscure concepts only a few decades ago, have all become clearer in the mind of geneticists thanks to flies, grasshoppers, mosquitoes, cockroaches and their allies. By virtue of their remarkable biological diversity and usefulness as experimental organisms, these evolutionary versatile arthropods have contributed much to our present understanding of the laws of heredity and variation. This knowledge may indeed disclose the only rational way to anticipate the infinite strategies of natural selection, long against us in the ancient war with our minute and resourceful enemies.

Resistance to pesticides

For years we have sprayed insects and crops with all sorts of "prodigious" chemical recipes. Pest populations, with the help of natural selection, have responded by evolving strains resistant to the particular pesticide that achieved satisfactory measures of control in previous generations. The sequel is what appears to be an endless, and perhaps hopeless, race between chemical industries and the evolutionary versatility of the insects. Even in the laboratory it may be possible to select artificially for resistance to DDT or other insecticides or to poisons such as copper sulphate.

One may wonder whence the genetic variance selectable for such resistance comes? Has nature equipped insects with genes for resistance in anticipation of chemists inventing ever new insecticides? Of course this is not so; resistance to insecticides is achieved by modification of physiological processes that originally served quite different functions. For example, houseflies resistant to DDT contain hydroclorinase, an enzyme that is also present, though in much lower quantities, in non-resistant strains.

Strains of houseflies resistant to DDT appeared independently in many countries, as have strains resistant to dieldrin, to organophosphorous compounds such as malathion, to carbamates and to nicotine sulphate. Strains resistant to DDT and dieldrin have been found and studied genetically in several species of anopheline mosquitoes, in *Culex fatigans* and *Aedes aegypti*, in the cockroach *Blattella germanica*, in the cattle tick *Boophilus microplus*, in bed bugs and in body lice. Some scientists have looked for evidence as to whether mutations that confer resistance are present in pest populations before the insecticide is applied, or arise after the application. This question is usually insoluble, and it is of no particular importance anyway. The numbers of individuals in the populations of some pests are so great that even rare mutants are likely to be present in many localities. More important, from both the practical and the theoretical standpoint, is whether natural selection completely replaces the genes that make the insect population sensitive with those that make it resistant to a given insecticide. If it is true, as almost certainly is the case, that the resistant variants are at least slightly lower in "fitness" than the non-resistant ones in the absence of insecticide treatments, then some of the latter may well be preserved in the populations. When the application of a given insecticide is discontinued because it is no longer effective, the selection pressure that favoured the alleles for resistance is relaxed, and in fact may be reversed in favour of the original alleles for sensitivity. Hence, after some generations of reversed selection the population may become sensitive again.

But it is obvious that even if this appears as a ray of hope for the chemically frustrated farmer, one can hardly expect him to wait patiently and watch his crop being devoured by millions of greedy little beasts slowly developing a "new sensitivity". So, while research into more rational uses of pesticide control is still in progress, it seems clear that the only reasonable hopes of durable revenge for the belligerent farmer lie in the brains, hands and tools of geneticists. By devising a number of biological methods of control based on sophisticated genetic techniques and predictive theoretical models, they ultimately hope to modify the genetic architecture of specific insect pest populations in such a way as to reduce their size drastically or, wherever possible and desirable, to completely suppress them.

Meiotic drive

One of these methods depends on "meiotic drive". Although essentially a "sexual" phenomenon, meiotic drive has nothing to do with "sex drive". Most of the terms used by geneticists are difficult to translate into simple language, and this is no exception. The explanations of meiotic drive

and of other genetic manipulations given in this article are perforce over-simplified.

Every cell in an animal contains a certain number of paired chromosomes, but the germ cells produced by each parent, which unite to form their offspring, contain only one chromosome from each of the pairs. In any animal it is entirely fortuitous which component of the paired chromosomes appears in the offspring. However, because an insect produces such a large number of progeny there is a statistical probability that every chromosome the parent possesses will appear in 50 per cent of its progeny. And, this is what normally happens. However, when meiotic drive occurs, one of the two chromosomes making up a pair appears in as many as 99 per cent or more of the offspring while the other member of the pair virtually disappears. If the sex chromosomes happen to be the ones affected, then, depending on whether the X or the Y chromosome is "driven", either 99 per cent of the offspring will be female or 99 per cent will be male. But it is a short lived paradise for the minority sex and one that would rapidly lead to the extinction of the population if large numbers of insects with a "driven" sex chromosome were bred and released simultaneously. The phenomenon has been induced artificially by irradiation in the vinegar fly, *Drosophila* sp., and attempts in this direction are being made with other insects, for example, with the Australian sheep blowfly.

Sterile Males

Entomologists of the U.S.D.A. led by Dr. E. F. Knipling have been successful in eradicating the screw-worm fly from Florida by releasing massive numbers of sterilized male insects. For this technique to be successful, the sterilized males must be released at frequent intervals for at least six generations. The number released on each occasion must be at least nine times the total wild fly population prevailing at the time of the first release. The statistics behind this stratagem are not too complex. Basically it depends on swamping the population with sterile males so that the chances against a normal female being mated by a fertile male are initially 9:1. This is enough to reduce the population by half. With the same number of sterile flies released into the reduced population, the odds become even longer and the subsequent population further decimated, until by the fifth generation the chances against a fertile mating are 180,000:1. At this point eradication can be expected. Modifications to this process aim at reducing the number of flies that need to be bred and the number of occasions on which they have to be released.

Although highly successful in the particular case of the screw-worm fly in the southeastern U.S., the sterile male method cannot be readily or easily employed with high-density populations of pest species characterized by extensive geographical distribution. Breeding such vast numbers of insects is costly enough, but the logistics of storing, transporting, and setting free the insects at places within a few miles of each other over the entire, infested area can be overwhelming.

Booby Traps

One type of pest management on which some entomologists are presently working is a form of "booby trap". It consists of entomological "femmes-fatales" — each female insect carries a chemical that either kills or sterilizes any males attempting to mate with her. So far no suitable sterilant for field use has been found. In the lethal variety of booby trap, a sterilized female insect carries an insecticide to which she herself is highly resistant. However, the insecticide must be one to which the existing insect population generally has no resistance. Within reason, the cost of manufacture, harmful effects on livestock, or accumulation in tissues are of no account when the insecticide is used in such minute quantities in this way, thus providing a wide range of chemicals to choose from. But one perhaps insuperable and certainly rather ironic difficulty bars the way to the creation of these deadly traps.

While resistance arises almost inevitably following repeated exposure of a natural insect population to an insecticide, it is extremely difficult to induce in the laboratory. The reason, of course, lies in the vast numbers of insects being subjected to selection pressure when stockmen and farmers are regularly dipping or spraying their animals and crops relative to the comparatively minute populations involved in even the most ambitious laboratory project.

Integrated Genetic Control

Another important line of investigation, which perhaps offers the best hope of success, depends on the creation of "synthetic"

strains of insects in which multiple chromosomal "translocations" have occurred. A translocation — meaning that part of a chromosome has altered its position or has attached itself to another chromosome — can be produced quite readily by irradiation. Most translocations are lethal or sub-lethal, but an occasional one without any deleterious effects does arise. When this eventually occurs, the insect is repeatedly backcrossed to get rid of any lethal genes that may also have resulted simultaneously from the irradiation. A program of in-breeding follows to produce a strain that is homozygous with respect to the new genetic structure. The whole of this time-consuming process must be repeated a number of times if one is to produce a synthetic insect strain in which the co-existence of different translocations is required. Mating between such a synthetic strain and a normal insect will produce sterile hybrids, and if the "synthetics" are released in numbers slightly exceeding the indigenous population then they will rapidly displace the latter. In the case of the sheep blowfly of Australia, for example, it is sufficient, in theory, to release only five per cent more for the normal population to be displaced. In practice a much higher percentage would be set free to allow for possible lower vitality of the "synthetics" and the obvious difficulty of counting the existing blowflies exactly. The latter would die out in the course of about five generations, i.e., in one summer. The synthetic flies would have to be released once only, not repeatedly as in the case of the sterile-male method.

If this were achieved, would one not have a population of new synthetic blowflies just as likely to cause strike in sheep? The answer is yes, to some extent, but flies with a difference. The ones from which the Australian geneticists are trying to produce their synthetic strain do not possess any insecticide resistance, unlike the wild populations. Thus the new population would at least be controllable with mild doses of a "good" insecticide, such as diazinone. The coup de grâce could be administered by including in the genetic constitution of the synthetic blowfly a conditional lethal gene. Such a gene may, for example, render the fly or its larvae particularly susceptible to cold. The new flies would then displace their indigeneous sisters during the summer and then themselves die out in the winter!

A short-term prediction

In conclusion it is clear that while a few methods, such as male sterilization, have led to spectacular success in the control or eradication of some insect pests, others are only at an embryonic stage of experimentation. It is undeniable that the more refined genetic approaches to insect control appear extremely promising both on theoretical grounds and on evidence from laboratory results. But all sorts of technical hazards may yet beset the path of scientists and delay the translation of theory into practical success in the field.

So, while geneticists and entomologists are toiling away in their laboratories, it looks as though at least for the next few summers, as far as we are concerned, it's back to the smelly old can of "Off".

(Anyone interested in this subject may obtain a selected list of references from the author.)

Excess Manure Can Be Toxic

by G. M. Barnett,
Canada Agriculture,
La Pocatière, P.Q.

Manure has always been a valuable resource in agriculture. Much effort was devoted to determining the interaction of environment on its value. Until the advent of chemical fertilizers, farmers had to decide where to use this limited resource to best advantage in their crop systems.

The number of animals per farm unit has greatly increased and in many cases feed is shipped hundreds of miles to the animal production centre. Many feedlots and poultry enterprises have little or no land attached to them. The disposal costs of manure, because labour and machinery are expensive, are not defrayed by the value of the bulky low analysis manure fertilizer.

One change from the practices of a few decades ago is the volume of manure generated in one spot, and now numerous additives are included in feed rations. For example, salt is included in the diets of feedlot beef animals to induce higher water consumption and reduce the incidence of urinary calculi. Feeder hog diets include up to 250 parts per million (ppm) of copper, 95 per cent of which is excreted in the feces. The copper increases feed conversion. To prevent Newcastle disease in poultry, antibiotics are administered via the water. In large part, these compounds end up in the soil plant recycling system, since this is the least expensive method of manure disposal. Considerable quantities of zinc, copper, salt, and antibiotics are therefore applied to soils and plants with manure.

All biological systems have an optimum. If too much fertilizer is added to a plant, its growth will be retarded or it may even be killed. The same situation exists in humans. Humans need a certain quantity of salt and sugar but if that quantity is exceeded, the human becomes violently ill. But at normal quantities of salt and sugar these compounds are completely harmless. What happens when high rates of manure — a complex chemical mixture — is applied to soils and to plants? What repercussions may be produced on humans and other animals if the capacity of the soil plant system to digest manure is exceeded?

Crop yield

The soil digests manure into nitrogen compounds and into other organic compounds. The plant can only use the broken down simple compounds. Plants can use all the nutrients supplied to them up to a point but, after that, excess nutrients become toxic. Yields decrease because plant growth is retarded. Too much manure can reduce yields.

Pollution of water

If excess nutrients are applied, that part beyond plant needs will, in part, leach and pollute the groundwater and eventually pollute streams. Excess manure at the soil surface will also cause pollution by runoff, particularly manure applied to frozen soils.

Soils have a relatively large capacity to fix phosphorus into insoluble compounds but this capacity is not limitless. Nitrogen can also be fixed by the soil into insoluble compounds provided the carbon to nitrogen ratio is relatively low. However, manures often contain much nitrogen. Once the fixation capacity is exceeded, groundwater pollution will occur.

Nitrate pollution

Nitrate-nitrogen limits for water for human consumption is 10 ppm. In a survey in Quebec four per cent of wells were found by Dr. Ben Warkentin of Macdonald College to contain more than this amount. Nitrate contamination is a real possibility from feedlot runoff and from heavily manured and fertilized fields.

One farmer found milk production to drop when nitrate-N attained 185 ppm in his well. By substituting spring water low in nitrates, milk production increased 20 per cent.

Babies up to six months, humans or animals with dysentery, and piglets are particularly susceptible to nitrate-N levels over 10 ppm. The nitrate is reduced in the blood to nitrate which reacts with hemoglobin and hence reduces oxygen carrying capacity. An affected child becomes listless and drowsy, the skin takes on a blue colour, heart and breathing rates increase, and the blood turns to a chocolate-brown colour. This condition is called cyanosis or blue-baby.

Similar conditions occur in animals in cases of nitrate toxicity. Mucous membranes take on a blue hue. Muscular weakness, incoordination and increased heart and respiratory rates occur. Severe toxicity results in convulsion and death. Pigs are most sensitive to elevated nitrate levels followed by cattle, then sheep, the horse being least sensitive. Both babies and calves that suckle their mothers can get

The general concept is that soil can accept all the manure that can be applied to it. However, over application can lead to environmental and health problems.

nitrate poisoning if their mothers drink high nitrate water. Not only can nitrate contaminated water cause toxicity, but it may have sub-lethal effects. These are increased abortion, reduced milk production, stiffness and lameness.

Water pollution by salt

Manure contains many salts especially where animals are fed a salt supplement. Runoff from manure often contains much salt and results in contamination of water supplies. Water up to 3000 ppm salts is acceptable for poults. Over 4000 ppm is not advised for any class of poultry. Young pigs should not consume water with over 2500 ppm, and for older stock 5000 ppm is the limit.

Water pollution by bacteria

Transmission of disease by contaminated water lives in infamy in the pages of history. Generally the contaminating sources were human or animal waste which harbours bacteria and viruses causing salmonellosis, leptospirosis, hog cholera, tuberculosis, brucellosis anthrax, hepatitis, diarrhea and respiratory diseases.

People have become complacent about disease with the medical control that can be exercised today. An American study found that many shallow wells were highly contaminated from bacteria traced to animal manure. A survey in Manitoba found 75 per cent of rural wells to have bacterial contamination. Contamination of water supplies by manure leaching and runoff is very real, especially since both wells and animals are normally in close vicinity on farms. High field application rates are a definite threat to water supplies.

Results of water pollution

From 1964 to 1967, 80 per cent of the fishkill in Kansas was traced to feedlot, silo, or field sources. In 1964, eight per cent of the U.S. fishkill was traced to these sources. Runoff from a feedlot into a stream decimated a dairy herd downstream when it drank the contaminated water. Water contamination by careless manure disposal, storage, and excess application poses a real threat to animal and human health.

High manure rates and plant physiology

Plant toxicity

High salts and nitrate cause plants to grow poorly. The high salt content in manure has caused salt toxicity in plants. Soils with a conductivity over 0.5 millimhos per centimeter are potentially damaging to field and vegetable crops. High ammonia concentrations of 500 ppm or more cause ammonia burn and is a very real possibility. Corn and potatoes are more tolerant of salts than grass or legumes.

Nitrate poisoning

Where high manure or fertilizer nitrogen is applied, the foliage of plants reaches high levels of nitrate. Over 0.21 per cent nitrate-N in forages is toxic. In Ontario livestock were killed after ingesting forage containing 0.4 to 0.5 per cent nitrate-N. This forage had been grown on land receiving 4-5 times the recommended manure rate. Grain does not accumulate nitrate but manure is not recommended for cereals because of the lodging problem.

Grass tetany

Manure has a relatively high potassium content compared to calcium and magnesium. A high potassium application will reduce the uptake of calcium and magnesium in plants.

Grass tetany is a nerve and muscle response and death is associated with muscular spasms and shaking. Soils with low magnesium are tetany prone. Poultry manure over four tons per acre is particularly conducive to grass tetany particularly on fescues. Grass tetany is prevalent in the Lower St. Lawrence on fertilized pastures — with both chemical or manure fertilizers.

Agalactia

Failure of udder development and milk secretion at parturition has occurred with cows on pastures fertilized with over 10 tons poultry manure per acre. A grain supplement 4-6 weeks before calving has prevented this.

White muscle

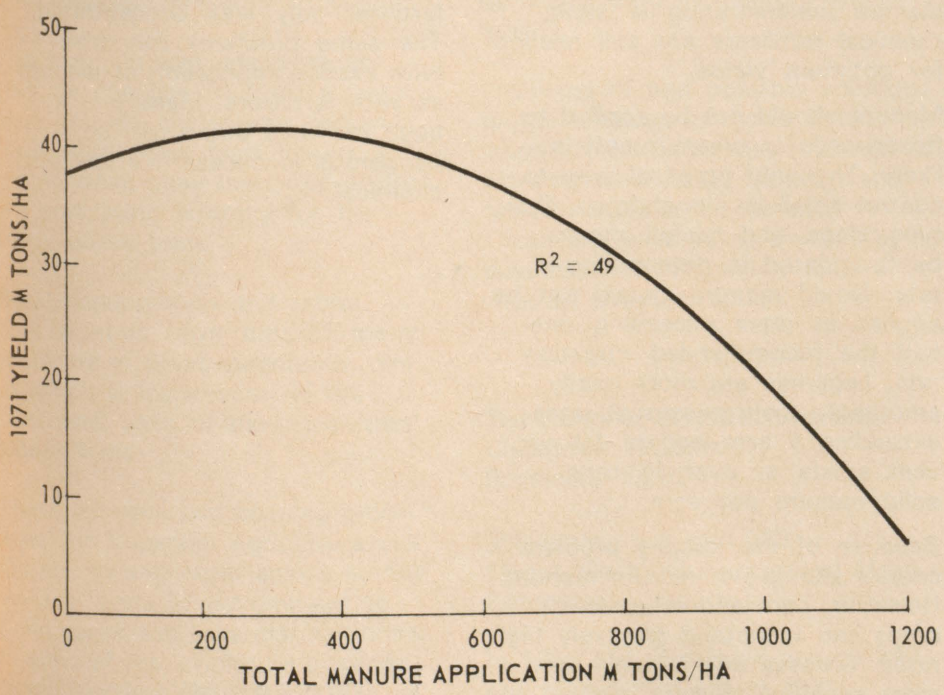
High broiler manure rates on pasture have depressed forage and blood selenium levels. Selenium deficiency is associated with white muscle or muscular dystrophy and is prevalent in Abitibi and the Lower St. Lawrence.

Fat necrosis

Fat necrosis has been discerned in animals grazing on heavily fertilized pastures (greater than 10 tons poultry manure). This is the occurrence of irregularly shaped and sized masses of hard dead fat in the abdominal cavity of cows. These accumulations of dead fat can interfere with calving and can strangulate the small intestine and the urinary process causing death. Death comes suddenly without apparent cause. In one case, over 87 per cent of a herd was affected. In 1968 1400 cases were diagnosed in Georgia. It has been a problem associated with tall fescue pastures heavily fertilized.

Micronutrients

Most of the micronutrients — copper, zinc, aluminum, manganese — added to feeds are excreted in the manure and therefore high applications of manure involve high micronutrients applications which are potentially toxic. Copper at 80 ppm is toxic to grass and arable crops; for legumes 30 ppm is toxic. In Australia high soil copper levels induced levels of 50-60 ppm in grass which poisoned sheep. Cattle and sheep deaths have been reported where the animals grazed in orchards and vineyards. Normal soil copper levels in soils and herbage have induced copper toxicity where molybdenum is low. Copper toxicity is also dependent on levels of iron, zinc, calcium, molybdenum, inorganic sulphate and other unidentified components. To date no copper toxicity has been reported from high manure applications. Nevertheless short term applications of hog manure have resulted in marked increases (50 per cent) in soil copper and it is suggested that copper additions be limited to 8.5 pounds per acre per year. Pasture having received manure should be washed several times by rains to prevent ingestion of the manure attached to plants.



1971 Corn Forage Yield as Affected by 1969 and 1970 Manure Treatments. Murphy et al (1972).

Waste Management Research 1972.

Other metals in manure increased by supplements in feed or by antibiotics bear watching — zinc levels in forage in excess of 500 ppm are toxic to cattle.

Other problems

Smothering

At greater than 15 tons solids or 1 acre-inch of 10 per cent suspended solids, grass-legume stands can be affected by smothering. Legumes which have a prostrate growth habit will be smothered at high rates while grasses, having an upright growth habit, will not. High applications can therefore change the botanical composition of a stand. Corn stands can withstand higher rates without being smothered.

Soil sealing

Manure contains various fats and waxes and salts that cause soil structure breakdown and sealing of soil capillaries. At high rates of application, water infiltration is decreased and runoff increases. The problem is more serious with liquid manure and it is recommended that not more than one-half the recommended irrigation rate for clear water be applied.

Conclusion

The engineering capacity to apply practically any rate of manure is available. However, it is not the capacity of the machine that will limit applications but the capacity of the biological system — the soil, the plant and the animal — to withstand such rates without damage. Too much manure can reduce yields and profit considerably and increase health hazards dramatically.

Besides plant and soil damage, the other worry is pollution. Phosphorus, potassium and microelements react with soil compounds to form insoluble complexes. It is nitrogen as nitrate that causes worry. It has been suggested by Dr. Ben Warkentin of Macdonald College that 450 pounds of nitrogen as manure can be safely applied to crops without harming the crop or causing pollution. Because the composition of manure varies greatly from farm to farm, it should be determined for each case. Machines for application should be calibrated such that the rate of application is known. Manure and fertilizer applications should be varied according to soil test — less manure and fertilizer on high test soils — less fertilizer where much manure is applied. Because manure mineralization is slow, chemical fertilizers are still needed for optimum yields.

Manure should not be applied to frozen soils or where runoff is likely. The only practical way to control smell is ploughdown. Soil type, slope, and rainfall should be considered in determining a rate. Liquid manure should not be applied at rates exceeding one-half the recommended irrigation rate. Legumes are more easily smothered than grasses at rates exceeding 1 acre-inch of 10 per cent solids or over 15 tons solid manure per acre.

Because of the lodging problem cereals should not receive manure. However, corn and other row crops can withstand relatively high rates. Grasses and legumes are more sensitive to salts in the manure.

When higher rates (over 15 tons per acre) are used on crops, animals should be watched for loss of appetite, increased abortion milk production decrease, dull coats, listlessness, stiffness, limping, dysentery, increased water consumption, increased breathing rate, or death without cause. Anyone of the problems cited above may be present. Be extremely careful about runoff and leaching to water supplies from manure.

Some of the problems that can arise from high rates have been noted. Nevertheless each farm is a particular case and may have particular requirements in which case the agronome, university, or research station can help.

Manure is a highly complex mixture of chemicals like chemical fertilizer only less concentrated. The same problems can arise with excess application of manure as with fertilizers. Manure is a huge resource but it can be dangerous in excess like any other chemical.

The Family Farm

Published in the interests of the farmers of the province by the Quebec Department of Agriculture

Farm Labour

Canadian agriculture has undergone profound changes during the last 25 years. Farm labour has become increasingly scarce. This is particularly true with regard to full-time workers with experience in livestock. Moreover, the aging of Canadian farm producers is also symptomatic of the disturbing decline in the number of young farmers entering agriculture.

Farmers have had to mechanize their operations. Mechanization in turn has influenced the creation of larger farm units and these require well-trained farm labour. They also require well trained farm-owner-operators capable of managing farm operations with capital assets often in excess of one hundred thousand dollars.

The technological advances as well as changes in farm structure have created a dramatic demand for well-qualified farm labour at a time when other industrial sectors are competing strongly for the same labour force.

Rural depopulation and urban concentration have created many problems of great magnitude, one of which is the erosion of the traditional base of the agricultural labour force.

These changes and ensuing problems for Canadian agriculture call for strong and rapid action by the various levels of government to bring about the essential solutions. In view of the amplitude of gross farm income ($5,280,811,000 in 1971), the total capital value ($24,067,857,000 in 1971), the value of agricultural exports ($1,-993,000,000 in 1971), the possibility of growth for Canadian agriculture, the large number of persons involved (1,489,565 in 1971), the ever increasing demand for agricultural products and even the predicted world-wide shortage of food by 1980, there is an urgent need for immediate and energetic action by all levels of government to ensure harmonious development of this sector of our economy.

Recognizing that agricultural manpower is one of the most limiting factors in the development of this vital sector of our economy should command adaptation, adjustment and full implemenation of existing programs as well as setting up new ones and allocating increased resources for training, recruiting, and placing of a labour force sufficient both in quantity and quality.

Problems of and possible solutions to the shortage of good farm labour come under the headings of working conditions, training, and recruitment and placement. These are now being studied by governments in Canada with a view to effective action.

The Farm of Lloyd E. Brownlee
Clarendon (Pontiac)
Brownline Farm

905 points out of 1,000
(From the 1973 Agricultural Merit Competition reports)

In 1968 Mr. Brownlee scored 882 and placed fifth out of 103 contestants, thereby earning a silver medal the first time he took part in the Agricultural Merit competition. In 1973 he came second in the gold medal class. His 160 acres, most of which (155 acres) is under the plough, consists of two nearby farms with clay soil. This land, which he has owned since 1934, he now farms with the help of his two sons, Denzil and Elson.

Being well aware of the benefits of drainage, he has already drained a considerable part of his land. Every year the fields are limed in accordance with recommendations based on soil analyses and are treated with 30 tons of fertilizer whose formula is varied to suit the different crops. Weeds are controlled by summer fallowing and with herbicides.

Of the arable land, 82 acres are in corn and the rest in hay, thus providing all the forage for the herd. The milking cows are not put out to pasture but are fed in the barn and on a feedlot. The two fields of corn look somewhat different; the stand on the main farm tends to be sparse but that on the home farm is uniform and growthy. In some fields, the alfalfa seems to be having difficulty owing to insufficient drainage.

The slight shortcomings noticed in the fields are largely made up for by the remarkable way in which the buildings are kept and the quality of the animals. The herd consists of three bulls, 102 milk cows and 60 head of young stock, all Jerseys. The average annual milk yield of the herd is 8,500 pounds. Following are records of some of the cows.

Name	Registration Number	Age at Calving	Production (305 days)		B.C.A."s
			Milk	Fat	
BROWNLINE ROCKET JANE....	0360971	9 yrs 219 days	11680	669	166 - 176
BROWNLINE GAY LADY.....	0395055	7 yrs 90 days	11461	630	152 - 155
BROWNLINE ROYAL SADIE....	0445223	4 yrs 69 days	10581	557	147 - 144
BROWNLINE ROYAL PAULINE..	0431311	4 yrs 66 days	9613	583	134 - 150
BROWNLINE ROYAL DONNA....	0439393	3 yrs 324 days	11859	753	167 - 197
BROWNLINE ROYAL HELEN....	0439403	3 yrs 175 days	8993	538	131 - 145
BROWNLINE LESTER PEG.....	0439405	3 yrs 138 days	9951	516	147 - 141
BROWNLINE RULER DAWN.....	0439406	3 yrs 30 days	9262	522	140 - 146
BROWNLINE DUKE, S VON.....	0439397	w yrs 233 days	8540	566	136 - 137
BROWNLINE ACE S. LOTTIE....	0445300	1 yr 346 days	7709	380	134 - 123

All the buildings look excellent. The main barn is flanked by a 35′ x 14′ silo and another silo was being built when the judges visited the farm. This barn is 160 feet long and has 86 stalls and two feedlots. It is spotlessly clean, painted, and well ventilated. The milk is piped to a 4,386-pound bulk tank.

The barn on the second farm is used to house the bulls. There is a 35′ x 14′ silo adjoining it.

All the machinery is kept in suitable buildings and there is a small but well-equipped shop for repairs and maintenance.

The dwelling, which was built a number of years ago, has every modern convenience. The bushes, flowers and spacious lawn surrounding it gives it a most attractive appearance.

Exhibition Assistance Policy Under Review

The entire exhibition assistance policy is currently being reviewed to ensure that the policy accommodates the needs of the agricultural community. According to F. E. Payne, director of the Livestock Division of the Canada Department of Agriculture, the role of fairs and exhibitions is changing and the Department's policy with regard to supporting the major fairs across Canada must be reviewed regularly.

Following the changes in the federal grant structure in 1965, grants have been made available for qualified judges as well as prize money for livestock classes based on utility factors. These grants are aimed at contributing to livestock improvement, not the subsidization of fairs and exhibitions.

In addition, grants are provided for young people through inter-club competitions among 4-H and Junior Farmer members. These grants are intended to assist in the development of rural youth as the future leaders in our rural communities and as contributors to the improvement of rural life.

Annual Permanent Improvement Grants are available to assist fairs in maintaining existing facilities or to create new facilities for the purpose of presenting agricultural products to the general public in a manner that will encourage a broader consumer knowledge. In so doing, this will encourage greater consumption of agricultural products.

To provide the opportunity to outline and promote the role that the producer plays in the production of wholesome food, a pilot project has been established whereby Class "A" fairs have the opportunity of using 20 per cent of their prize money grant toward the presentation of promotional displays of agricultural products provided an equal contribution is made from the exhibitions and agricultural and industrial organizations.

In addition to the grants, the agricultural exhibitions loan program has been established to stimulate the economy and to provide multi-purpose structures that would improve exhibition facilities and would also accommodate a variety of community activities. Following recognition of an Exhibition Association by its respective provincial organization, application for loans with terms up to 30 years can be presented to cover up to 90 per cent of the cost of approved multi-purpose facilities. Terms of the loan are based on need and the ability to pay. All long-term loans are guaranteed by the municipal bodies that will benefit by the loan or by the province in which the fair is located.

As Mr. Payne pointed out, exhibitions represent one of the major showplaces for Canadian agriculture and we must emphasize

he value of combining type and performance in the improvement of our livestock so that we can continue to meet the demands on our domestic and export markets. Exhibitions provide a show window for agriculture and a marketplace for its products.

From Canada Agriculture, Fall 1973)

Protein Sources for Livestock

This 24-page publication provides a useful guide for livestock feeders in selecting adequate protein sources in the formulation of rations. Prepared at a time when protein costs are extremely high, emphasis is placed on the relative values of various protein sources and thumb rules are given to assist farm operators in adjusting their rations in line with production.

It is stressed that balanced rations must be provided in order to allow full utilization of the protein by the animal. Energy, minerals, and vitamins must be supplied in adequate quantities to ensure the best use of protein. Several protein sources are discussed, noting any particular factors that may be pertinent to proper ration formulation. Protein sources are considered on the basis their application in rations for swine or poultry and also for ruminant nutrition.

Copies of Publication 1515, Protein Sources For Livestock, are available from the Information Division, Canada Department of Agriculture, Ottawa KIA 0C7.

(From Canada Agriculture, Fall 1973)

Broiler Raising in Canada

This new 48-page publication outlines the major management principles of broiler-raising enterprises. The publication points out that although broiler enterprises are a relatively new segment of the poultry industry, receipts from the sale of broilers in 1971 were 66.6 per cent of all receipts from the sale of poultry meat in Canada.

All major management aspects of broiler raising including environmental requirements, feeding principles, disease prevention, marketing, cleaning and sanitation are discussed.

Copies of Publication 1509 are available from the Information Division, Canada Department of Agriculture, Ottawa, K1A 0C7.

(From Canada Agriculture, Fall 1973)

News Items From Europe

In any sort of European Agricultural Olympics, Holland would certainly take the gold, with U.K. and Denmark fighting it out for the silver, and France coming up fast on the outside.

Only about one-third of the farms in Germany are now full-time holdings. The other two-thirds are owned by people who have commercial or industrial work and who come home to farm only part-time. A love of land ownership lies very deep in the German character and even those who have left a farm altogether will retain ownership and allow the holding to become derelict rather than sell it. Farm renting is relatively unusual — only about five per cent of farms are wholly rented, and rents are low.

In Holland all milk is reduced to a standard fat content of three per cent. Because the butter fat average of the Dutch Friesian is 3.8 per cent, this levelling down provides a solid nucleus for the butter, cheese and processed milk market — approximately one-third of the Dutch milk output being creamed off in this way. Only 21 per cent of the total milk produced in Holland goes for direct liquid consumption against two-thirds of the total production in U.K. — the Dutch consumer drinks only three pintas for every four drunk by the U.K. consumer — and almost 80 per cent of the milk produced in Holland moves into the processed market, either as butter, cheese, condensed milk or animal feed, etc.

The Dutch are becoming heavy margarine eaters and the Dutch dairy industry is very concerned at the quite dramatic drop in butter consumption.

(From Euro-Farm Business)

(The following article by F. S. Warren, research scientist in the Forage Crop Section at the CDA Research Station, Ottawa, Ontario, is reprinted from Canada Agriculture, Fall 1973.)

Losses In Harvesting Grain Corn

Harvesting is a critical operation for the grain corn producer. Each year, thousands of bushels of corn are left in the field. In eastern Canada, wet weather at harvest makes the job particularly hazardous. Losses range from an estimated 5 per cent under ideal conditions to a probable average of about 8 to 10 per cent. All too frequently, some fields have to be abandoned completely. Livestock can be used to salvage much of this corn left in the field. However, the cash crop producer seldom can take advantage of this option.

Any corn missed in harvesting is a straight loss and may well eat up all the potential profit. Information on the extent of such losses and how to minimize them are of vital concern to the farmer. Accurate and meaningful information is scarce and hard to obtain. Conditions vary so much from season to season, between fields and hybrids, and because of damage caused by diseases, insects, birds and weeds that even the most careful estimates are not too reliable.

In order to get more useful information, researchers at the Central Experimental Farm, Ottawa, set up an experiment to measure grain losses in relation to harvesting conditions. Each year for three years, eight hybrids recommended for the region were grown in large plots under conditions closely resembling actual farming practice.

Seeding was done with a regular plate-type planter, modified for easy clean-out and changing seed lots. Planting density was closely controlled at just over 22,000 plants per acre. The fertilizer program was calculated for a yield level of 125 bu/acre. Nearly complete weed control was achieved by the use of recommended herbicides with cultivation as required. All cultural operations were done with regular farm equipment.

Each hybrid was grown in 16 separate blocks to permit harvesting four blocks of each at four successive dates. First harvest was completed about the first week in October when grain moisture averaged close to 30 per cent. Later harvests were made at two-week intervals and most years moisture at harvest decreased two to three percentage points between harvests.

Harvesting

A one-row picker sheller was used to harvest the corn. This machine was modified for the job by having the grain delivery spout lead to a built-on platform for easy collection of the grain samples. The actual picking and shelling operation was similar to that used on many farms in the district.

However, all the grain ordinarily lost in a farm operation was salvaged and weighed. Large jute bags were fitted over the various discharge openings to collect all the discarded material. Any grain passing on through the machine loose or on broken pieces of cob was later separated from the trash and recorded as a loss for that hybrid.

In addition, any ears or parts of cobs with grain missed by the machine were salvaged. After drying, all the good corn was shelled off, weighed and recorded as another loss for that plot.

Under good conditions, the total grain lost in harvest averaged just over five per cent of the total yield, or about 340 lb/acre. Plants and ears missed by the picker accounted for less than one-third of this loss as the machine was very effective in picking up lodged stalks. This type of loss remained almost constant in amount from year to year and for each harvest date under the most variable conditions. In other test areas, with poorly spaced rows and many broken stalks, losses due to missed plants were much higher. Losses due to grain and ears passing right through the machine were much more variable. Even with careful adjustment and slow operating speed, anywhere from 200 to over 400 lbs/acre of grain were lost in this way. Heavy weed growth or poor operating methods would greatly increase these losses.

By harvesting these corn hybrids at four successive dates each year, we expected to encounter a range of moisture conditions which should affect harvesting efficiency.

In the more average years of 1970 and 1971, our results were quite consistent. The lowest losses occurred with harvesting about the third week of October, with average moisture levels of 25 per cent. Losses were greater for both the earlier and later harvests. In 1972, a very wet year at harvest, the lowest losses were found for the earliest harvest with moisture content over 35 per cent. For all three years, the latest harvest in November resulted in the greatest loss, even though moisture levels were 22 or 23 per cent in two of the years. Very dry corn tended to bounce and fly out of the machine readily and adjustment could not reduce this type of loss.

Hybrid Performance

Hybrid performance was very consistent in this experiment. Certain hybrids had relatively low losses for each harvest date every year. Others were regularly high in the amount of grain lost on the ground or through the machine. The amount of loss did not appear to be related to the total yield of the particular hybrid. One of the highest yielding hybrids was actually one of the lowest in lost grain each year. Among this group of hybrids, both single and double cross types were represented. The greater uniformity of single crosses did not result in better harvesting performance.

Harvest losses in Ontario last year probably amounted to at least 10 million bushels. Only a portion of this could be salvaged by livestock. Careful management practices will greatly reduce harvest losses. All those factors which affect growth — seeding date, stand, density, fertility, weed control, rainfall, diseases, insects, and even bird damage — have a particular effect on harvest performance. This investigation indicated some ways of reducing harvest losses. However, even with the best technology and operating practices, our equipment could not achieve harvesting efficiency of better than three to five per cent losses. From observation of farming conditions, this is probably considerably better than average performance.

Summary of Ways to Reduce Harvest Losses

1. Grow a selection of recommended hybrids. This will spread the harvest over a longer period of time. Eliminate from future plans any hybrid with higher than average losses.

2. Employ good management practices. Plant early and for a population of 18,000-22,000 plants/acre. Fertilize adequately for the expected crop. Control weeds with recommended herbicides and/or cultivation.

3. Harvest when grain moisture levels are 27 to 23 per cent if possible. Adjust the machine carefully and operate at a suitable slow speed. Check frequently to ensure that the amount of grain and ears left on the ground is not excessive.

This Month with the QWI

Stepping Into the Past

The highlight of the year for **Howick W.I.** (Chateauguay - Huntingdon Co.) was a trip to Rennie's Museum. Living in the Chateauguay Valley and aware of its past history, keen interest was shown in viewing articles assembled in one place. This included the first Rennie home, a log cabin (1821), Cook's Store (1825), Black's Church (1829), the farm-house (1832) and another building housing farm machinery. Credit goes to Mr. Leslie Rennie, a retired schoolteacher, who uses his home as a museum.

The house looks like any normal farmhouse, but when one passes the old carriage in the carriage house and enters the home, one is in an enchanted house of 23 rooms with three staircases. The house is filled with buffets and cabinets, coloured glass and china, beautiful old lamps, with some remodelled to use electricity, grandfather clocks and an heirloom china clock ticking away the time which is wound every three weeks. Pianos, organs, books, papers, antiques, family and school pictures fascinated all.

Two fluted china bowls on a silver stand, called Bride and Groom Bowls, were used for money gifts. There is a tiny post office, once in use, and an elegant bed made for King Edward's use, with a carved guardian angel keeping watch over the King as he slept.

With so many rooms and staircases for hiding places, how could the Rennies know that all the children had gone to school, or overnight guests gone home?

Lunch on the lawn and a drive through beautiful country ended a delightful day. Eleven enthusiastic new members appreciate the friendly fellowship of Howick W.I.

Annual Banquet

The annual banquet of the **Grand Cascapedia** branch (Bonaventure Co.) was held in November in the Legion Hall, New Richmond. Approximately 150 people, including guests and members, were present.

The President, Miss Hazel Campbell, welcomed those present and extended thanks to all who, in any way, contributed to the work of the Institute. She also thanked the members of the branch for their cooperation and help during her term of office.

Mrs. Jean Starrak, Vice-President of the County, brought greetings in lieu of the President, who was unable to attend. She complimented Grand Cascapedia for their success in promoting different projects.

The Provincial Convener of Education, Mrs. Patrick Jones, extended greetings on behalf of the Quebec Women's Institutes. She explained the origin of this organization, by whom formed, and its aims. She also mentioned that the past October was the 50th anniversary of its beginning on the Gaspe coast.

Miss Campbell introduced the guest speaker, Mr. Buddy Campbell, who chose for his subject, "Ecology, the Energy Crisis, and You." He gave a brief summary of the part played by all people in the unintentional destruction of natural resources and suggested ways and means whereby we may conserve and thus avoid pollution and useless waste. Mr. Campbell's address was very interesting, informative and enjoyed by everyone.

A highlight of the evening was the presentation, by Mrs. Eulala Cochrane, Past President, of a Life Membership Pin to Mrs. Albert Paquet for her loyal support and work done during the years that she has been a member.

Much credit is due the Ladies' Auxiliary, who did the catering, and members of the Canadian Legion (Branch No. 172) for the success of the evening.

A Favourite Meeting

The August meeting of the **Ormstown** W.I. (Chateauguay - Huntingdon Co.) is one that is always looked forward to with great pleasure, and it is especially enjoyed if it happens to be a hot day.

Mr. and Mrs. A Hooker invite all members, and any friends they wish to bring, to a day at their summer cottage on Lake St. Francis, where it is cool and delightful on the lawn. We usually arrive about eleven in the morning, and shortly afterwards a bountiful lunch is served on a long table on the lawn. Lunch is provided by the hostesses for the day and by other members.

After lunch a short business meeting is held. The roll call last August was answered by "What I would miss most in my kitchen." The only ones who did not hestitate in their responses were the husbands present. Their unanimous

Hemmingford W.I. recently celebrated their 50th Anniversary. In the photo on the left are Branch President Mrs. P. Reed, Charter Member Mrs. C. Petch, Provincial President Mrs. J.W. Westover and County President Mrs. C. Bryson. In the photo on the right are members who received their 25-year pins: Front: Mrs. A. Somerville, Mrs. W. Keddy, Mrs. G. M. Brown. Back: Mrs. H. Palmer, Mrs. H. McAdam, Mrs. Florence Barr, Mrs. L. Simpson, Mrs. K. Campbell, Mrs. J. L'Esperance. Absent: Mrs. F. Greer.

nswer was "My Wife." After the neeting we enjoyed a social hour. Before we left for home we were erved cookies and tea or coffee. veryone was grateful to our hosts or a beautiful outing.

Anniversary Projects

Hemmingford W.I. (Chateauguay - Huntingdon Co.) was 50 years old n 1973. We had several projects

bench to the village. This wooden bench with cement ends is placed in the park beside the War Memorial near the Post Office and Town Hall. An engraved plaque on the back of the bench identifies it as the gift of the Hemmingford W.I. We hope it will be useful for those who want a rest while shopping, or waiting for the mail. On November 27, we celebrated

many years and as County Convener of Welfare and Health. She was Provincial President, and Provincial Convener of Welfare and Health and also served on the Federal Board. In 1939 she represented Q.W.I. at the ACWW Conference in London, England, and in 1941 was honoured with the Commander of the Order of Agricultural Merit, Province of Quebec. Mrs.

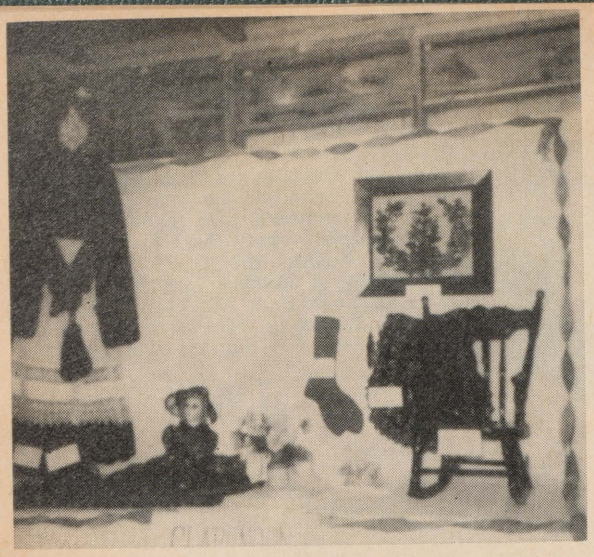
commemorate our anniversary. eginning in August, at the local pple Festival, we had a display handicrafts, clothes, and posters. ach convener prepared a poster epicting her convenership. These ntained photographs, pamphlets, ticles from newspapers, and her items. Our loom and samples weaving done at a recent course ere on display. We had a small lder printed listing our achieve- ents over the past half-century, d these were distributed, free, all interested.

October we presented a park

our actual birthday with an Anniversary Tea. Guests came from all branches in the County, and Provincial President Mrs. J. W. Westover was able to come with two friends from Sutton. The W.I. colours — blue and gold — were used in the table decorations, candles, and flowers. Our only active Charter Members, Mrs. C. Petch was presented with a 50-year pin. It was largely due to the efforts of Mrs. Petch that the Hemmingford W.I. began, and continued through the years. She served as branch President for

Petch attends every meeting and takes a keen interest in all our W.I. doings.

Ten members received 25 year pins, and Mrs. H. McAdam was presented with a Life Membership. A short program with excerpts from our history was presented. We sang a few of the old songs and two poems were read. One, "The Aims of the W.I." had been written by a previous member. The other, "My Wife Joined the W.I.", written by Mrs. P. Wilson, Hatley Centre W.I., some years ago, was dedicated to the husbands of the



Clarendon W.I.'s display at the Quyon and Shawville fairs included many old and precious articles. We quote from the Convener's letter which accompanied the photo: "The lady is made up on a dress form with clothes over 100 years old. She has laced boots, a lovely black bonnet and a cape handmade from sheep's wool and dyed. The little rocking chair was the first Christmas present I remember getting. The socks on the wall were made by my grandmother over 80 years ago. The picture is a hair wreath made from human hair. The owner, Mrs. Harold Hodgins, at 84, is our oldest member who still enjoys going to W.I. meetings and keeping in touch through reports in the papers and Macdonald Journal."

In recognition of 25 years as members of Stanstead North W.I., Mrs. Erwin Taylor, President (right), is shown presenting pins to Mrs. Douglas Johnston, left, and Miss Norma Holmes, centre.

W.I. members as a thank you for their help and cooperation over the years. The afternoon program ended with a member playing musical selections. Refreshments were served and everyone enjoyed meeting old friends and reminiscing. As a souvenir of our Anniversary, felt bookmarks in our colours of blue and gold were given to the guests.

One more project was the bringing up-to-date of our Branch History, to cover the 50 years. Copies were printed, so each member could have one.

Shawville's Centennial Made for an Exciting Year

1973 being Shawville's Centennial, it made a busy and interesting year for **Clarendon** W.I. members (Pontiac Co.).

During the year we had slides on Holland, Germany, and Austria. We had the pleasure of having the District Commissioner for Girl Guides as our guest speaker; she explained the program and gave the history of scouting. Twenty-two countries are involved in this movement. A donation was made to this worthwhile cause. We also contributed to UNICEF, Christmas Seals, and Pennies for Friendship. Eight Handi bags were made and filled for Save the Children's fund.

Our Hospital and the Ade Memorial Home are two of our special projects. A committee from our Institute attend all hospital auxiliary meetings. At the present time we are privileged in having one of our members as the president of the Central Auxiliary. Twice a year we contribute homemade cookies and at Thanksgiving we give fruits, jams, pickles, and vegetables. We donated curtains for a hospital room. Members help with the cart and our committee does sewing every month. Each member pays fees to the hospital auxiliary.

Our money-making projects included an auction sale, a Chinese auction, bring and buy sale, pay five cents for each window in your house, a surprise package wrapped and valued at $1 and a spring seeds and bulb sale.

Centennial year was featured by our Institute displaying Centennial articles at the Shawville and Quyon fairs.

Our branch participated in the member's conference held at Quyon and two of our members attended a rug-making demonstration.

Work never goes without fun. Our meetings were made interesting with contests, humorous poems, and readings. A 25-year pin was presented to one of our members. Our Christmas meeting took the form of a Potluck Supper. In January we served lunch to the Pontiac Agricultural Society annual meeting. And, of course, our bus trip to the Adelaide Hoodless Homestead will long be remembered. All our members' homes are displaying the A.C.W.W. tea towels as we purchased 28 of them.

We, as members of Clarendon Women's Institute, have tried to live up to our motto "For Home and Country."

Tips for Farm Safety

We are asking you — farmers, students, teachers, Women's Institute members, 4-H Clubs, Junior Farmers, tractor and machinery companies — for your ideas on farm safety. List your every day safety rules. What safeguards do you observe when working with machinery? Which ones, in your estimation, are the most important? Do roll bars cut down on serious accidents? Should they be standard equipment on all tractors? What other precautions do you take, or do you think should be taken, around the farm?

Help us to a safer farm by directing your answers to: Mrs. Gordon French, Provincial Convener of Agriculture, Sawyerville, Quebec, J0B 3A0. Watch for a resume of your answers.

Through the Years

Fourteen members attended the first meeting of **Granby West** W.I. (Shefford Co.) 20 years ago with Mrs. Ossington presiding. Down through the years they have lived up to their motto "For Home and Country", taking time to better themselves with

leadership courses, St. John Ambulance training, sewing, crocheting, sandwich demonstrations, and a hobby workshop.

For their school, with the help of three other branches, they organized the school cafeteria for students. They held rummage sales and card parties to raise money for the project. When needed, they went and served the children, not forgetting the needy ones. Every year they gave enough so one needy child could get free hot lunches.

For their community, they have helped the cancer society with donations, white gowns for the patients, cotton for bandages. They helped a family through the winter months and gave donations to people who lost everything in fires.

At Christmas, they prepared cheer boxes, supplied gifts for the children at school, gave them skates collected during the year and provided some with mittens. They brought a little joy to the elderly with their monthly visit and, especially for the holiday season, gifts and goodies were given each patient.

They gave two radios to Verdun Hospital and helped the retarded children in the Austin home.

For themselves, they have knit an afghan for each member, organized family picnics and Christmas parties and exchanged gifts. They made trips as a group and visited their members in time of sickness, cheered them with gifts while in hospital, and helped each other in time of sorrow.

Dear W. I. Members:

Receiving a little pat on the back, smiles and thank-yous were delightful rewards as several W.I. members and myself delivered Valentine boxes of homemade candy to a nearby senior citizens' home. So, as I read your many reports of similar good deeds, I know the thrill each of you get for your efforts.

School nurses have been telling us (as at **Clarendon)** that nutrition is a big problem with 85 per cent of the children not getting an adequate diet. **Matapedia** is giving capsules to primary grades and **Dunham** brought in sandwich makings and soups to aid with school lunches. Other branches help schools in various ways.

At **Ascot** Mrs. N. Siddiqui, Lennoxville housewife and teacher at Bishop's University, spoke on how women can take part in the affairs of the town council by attending meetings, by being alert to the needs of the town, i.e., mail delivery, pollution in rivers, the need of a recreation centre where people of all ages could enjoy activities. To the roll call, "How to keep from growing old" most emphasized the importance of exercise, interest in helping other people and using smiles to prevent wrinkles. Visitation cards were given out — members in groups of two visit the shut-in designated on the card.

Lennoxville's roll call "Cutting corners in housework" brought many helpful hints in meal planning. Rising prices were the subject of discussion. The history of sewing thread was read; and, with the aid of a chart, Mrs. S. Parker showed the promotion of bilingualism throughout the 10 provinces. In her 101st year, Mrs. Mary Worster received an Abbie Pritchard "throw."

A **Milby** member showed a pattern for recycling good material into warm mittens.

A local M.P. listened to an **Inverness** member's suggestion that he send out parliamentary literature in bilingual form instead of only in French, and the branch members sent him a letter of appreciation.

Kinnear's Mills' members were each given an envelope in which to collect 25 different stamps to be sent to the W.I. in Australia.

A sewing class teacher gave **Stanbridge East** members hints on sewing and proper method of choosing clothes for each type of figure. **Sawyerville** had a delightful fashion show on the latest spring styles, after which bridge and 500 were played. The mayor and his wife were present and congratulated the W.I. on their

splendid work and influence in the home and community.

Contests: French-English word at **Wyman;** matching two small words to make a compound word at **Fort Coulonge.**

Richmond Young Women have catering jobs for each month of the summer.

West Island's speaker was a lawyer from the Legal Aid Office in Lachine who explained how legal aid is provided for people who are unable to hire the services of a lawyer. A question period followed and the group got answers to many puzzling questions concerning law and its procedures.

Austin presented Mrs. S. Patterson and Mrs. R. Desrochers with Abbie Pritchard "throws" and **Abbotsford** held a card party instead of the regular meeting.

In closing — I would like to have heard the answers to **Marcil's** roll call: "How to use your knowledge."

Mrs. Perley Clark,
Q.W.I. Publicity Convener.

(Continued From Page 3)

most effective when the bindweed is in full flower, and again, drop pipes should be used to lessen the damage to the corn. Both herbicides can stunt the roots of the corn, and make it more susceptible to drought and lodging.

When it comes to milkweed, this is where the well-directed hoe comes in to effective use. And do not wait for this weed to become a real problem. The neighbours will be sure to notice it.

This brief review is intended as a guide to weed control in corn for 1974. The use of trade names (in brackets) for the purpose of example is not intended to endorse one brand over another, where a choice exists. The label on the container is the legal authorization for a herbicide's use and the responsibility rests with the user.

(Corn Weed Control 1974 was prepared for Corn Day '74, February 26, Hull, Quebec.)

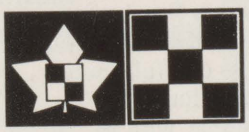
Help for a hungry world

Earth's appetite grows daily — and with it the need for ever more efficient use of food resources.

At Ralston Purina we believe our agri-products and programs are helping. We're active in many areas that have better foods, more foods and better production methods as their goals.

For example: research into new protein systems. Advice, counsel and arrangement to farm and stock operators around the world. Assistance to private sectors in agri-business. Development of low cost, high nutrition human foods.

We're working on many of the problems you'll be encountering as an agrologist. And we're also looking forward to working with you toward the solutions.



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